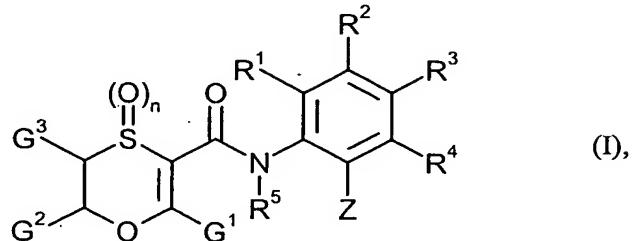


Patent claims

1. An oxathiincarboxamide of the formula (I)



5

in which

G¹ represents halogen, trifluoromethyl, difluoromethyl or cyclopropyl,

G² and G³ independently of one another represent hydrogen or methyl,

n represents 0, 1 or 2,

10

R¹, R², R³ and R⁴ independently of one another represent hydrogen, fluorine, chlorine, methyl, isopropyl or methylthio,

15

R⁵ represents hydrogen, C₁-C₈-alkyl, C₁-C₆-alkylsulfinyl, C₁-C₆-alkylsulfonyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₆-haloalkyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulfinyl, C₁-C₄-haloalkylsulfonyl, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms, formyl-C₁-C₃-alkyl, (C₁-C₃-alkyl)carbonyl-C₁-C₃-alkyl, (C₁-C₃-alkoxy)carbonyl-C₁-C₃-alkyl; (C₁-C₃-haloalkyl)carbonyl-C₁-C₃-alkyl, (C₁-C₃-haloalkoxy)carbonyl-C₁-C₃-alkyl having in each case 1 to 7 fluorine, chlorine and/or bromine atoms, (C₁-C₃-alkyl)carbonyl-C₁-C₃-haloalkyl, (C₁-C₃-alkoxy)carbonyl-C₁-C₃-haloalkyl

20

having in each case 1 to 6 fluorine, chlorine and/or bromine atoms, (C₁-C₃-haloalkyl)carbonyl-C₁-C₃-haloalkyl, (C₁-C₃-haloalkoxy)carbonyl-C₁-C₃-haloalkyl having in each case 1 to 13 fluorine, chlorine and/or bromine atoms; -COR⁶, -CONR⁷R⁸ or -CH₂NR⁹R¹⁰,

25

R⁶ represents hydrogen, C₁-C₈-alkyl, C₁-C₈-alkoxy, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₆-haloalkyl, C₁-C₆-haloalkoxy, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; -COR¹¹,

30

R⁷ and R⁸ independently of one another represent hydrogen, C₁-C₈-alkyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₈-haloalkyl, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl having in each case 1 to 9 fluorine,

chlorine and/or bromine atoms,

5 R⁷ and R⁸ furthermore together with the nitrogen atom to which they are attached form a saturated heterocycle having 5 to 8 ring atoms, where the heterocycle may contain 1 or 2 further nonadjacent heteroatoms from the group consisting of oxygen, sulfur and NR¹² and is optionally mono- or poly-substituted by identical or different substituents from the group consisting of halogen and C₁-C₄-alkyl,

10 R⁹ and R¹⁰ independently of one another represent hydrogen, C₁-C₈-alkyl, C₃-C₈-cycloalkyl; C₁-C₈-haloalkyl, C₃-C₈-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

15 R⁹ and R¹⁰ furthermore together with the nitrogen atom to which they are attached form a saturated heterocycle having 5 to 8 ring atoms, where the heterocycle may contain 1 or 2 further nonadjacent heteroatoms from the group consisting of oxygen, sulfur and NR¹² and is optionally mono- or poly-substituted by identical or different substituents from the group consisting of halogen and C₁-C₄-alkyl,

20 R¹¹ represents hydrogen, C₁-C₈-alkyl, C₁-C₈-alkoxy, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₆-haloalkyl, C₁-C₆-haloalkoxy, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

25 R¹² represents hydrogen or C₁-C₆-alkyl,

 Z represents Z¹, Z², Z³ or Z⁴, where

 Z¹ represents phenyl which is optionally mono- to pentasubstituted by identical or different substituents,

30 Z² represents cycloalkyl or bicycloalkyl which is optionally mono- or poly-substituted by identical or different substituents,

 Z³ represents unsubstituted C₂-C₂₀-alkyl or represents C₁-C₂₀-alkyl which is mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C₃-C₆-cycloalkyl, where the cycloalkyl moiety for its part may optionally be mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C₁-C₄-alkyl,

35 Z⁴ represents C₂-C₂₀-alkenyl or C₂-C₂₀-alkynyl which is in each case optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C₃-C₆-cycloalkyl, where the cycloalkyl

moiety for its part may optionally be mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C₁-C₄-alkyl,

or

5 R¹, R² and R³ independently of one another represent hydrogen or fluorine and Z and R⁴ together with the carbon atoms to which they are attached form an optionally substituted 5- or 6-membered carbocyclic or heterocyclic ring.

2. The oxathiincarboxamide of the formula (I) as claimed in claim 1, in which
10 G¹ represents fluorine, chlorine, bromine, iodine, trifluoromethyl, difluoromethyl or cyclopropyl,

G² and G³ independently of one another represent hydrogen or methyl,
n represents 0 or 2.

15 3. The oxathiincarboxamide of the formula (I) as claimed in claim 1 in which
R⁵ represents hydrogen.

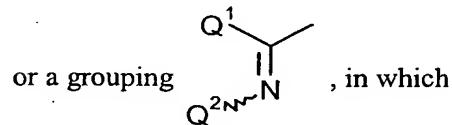
4. The oxathiincarboxamide of the formula (I) as claimed in claim 1 in which
R¹ represents hydrogen, fluorine, chlorine or methyl,
20 R² represents hydrogen, fluorine, chlorine, isopropyl or methylthio,
R³ represents hydrogen, fluorine, chlorine or methyl,
R⁴ represents hydrogen, fluorine, chlorine or methyl.

5. The oxathiincarboxamide of the formula (I) as claimed in claim 1 in which
25 Z represents Z¹,
Z¹ represents phenyl which is optionally mono- to pentasubstituted by identical or different substituents, where the substituents are selected from the list W¹
W¹ represents halogen, cyano, nitro, amino, hydroxyl, formyl, carboxyl, carbamoyl, thiocarbamoyl;

30 in each case straight-chain or branched alkyl, hydroxyalkyl, oxoalkyl, alkoxy, alkoxyalkyl, alkylthioalkyl, dialkoxyalkyl, alkylthio, alkylsulfinyl or alkylsulfonyl having in each case 1 to 8 carbon atoms;
in each case straight-chain or branched alkenyl or alkenyloxy having in each case 2 to 6 carbon atoms;

35 in each case straight-chain or branched haloalkyl, haloalkoxy, haloalkylthio,

haloalkylsulfinyl or haloalkylsulfonyl having in each case 1 to 6 carbon atoms and 1 to 13 identical or different halogen atoms;
 in each case straight-chain or branched haloalkenyl or haloalkenyloxy having in each case 2 to 6 carbon atoms and 1 to 11 identical or different halogen atoms;
 5 in each case straight-chain or branched alkylamino, dialkylamino, alkylcarbonyl, alkylcarbonyloxy, alkoxycarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, arylalkylaminocarbonyl, dialkylaminocarbonyloxy having 1 to 6 carbon atoms in the respective hydrocarbon chains, alkenylcarbonyl or alkynylcarbonyl having 2 to 6 carbon atoms in the respective hydrocarbon chains;
 10 cycloalkyl or cycloalkyloxy having in each case 3 to 6 carbon atoms;
 in each case doubly attached alkylene having 3 or 4 carbon atoms, oxyalkylene having 2 or 3 carbon atoms or dioxyalkylene having 1 or 2 carbon atoms, each of which radicals is optionally mono- to tetrasubstituted by identical or different substituents from the group consisting of fluorine, chlorine, oxo, methyl, trifluoromethyl and ethyl;
 15



20 Q^1 represents hydrogen, hydroxyl or alkyl having 1 to 4 carbon atoms, haloalkyl having 1 to 4 carbon atoms and 1 to 9 fluorine, chlorine and/or bromine atoms or cycloalkyl having 1 to 6 carbon atoms and
 Q^2 represents hydroxyl, amino, methylamino, phenyl, benzyl or represents in each case optionally cyano-, hydroxyl-, alkoxy-, alkylthio-, alkylamino-, dialkylamino- or phenyl-substituted alkyl or
 25 alkoxy having 1 to 4 carbon atoms, or represents alkenyloxy or alkynyoxy having in each case 2 to 4 carbon atoms,
 and also phenyl, phenoxy, phenylthio, benzoyl, benzoylethenyl, cinnamoyl, heterocyclyl or phenylalkyl, phenylalkyloxy, phenylalkylthio or heterocyclalkyl having in each case 1 to 3 carbon atoms in the respective alkyl moieties, each of which radicals is optionally mono- to trisubstituted in the cyclic part by halogen and/or straight-chain or branched alkyl or alkoxy having 1 to 4 carbon atoms.
 30

6. The oxathiincarboxamide of the formula (I) as claimed in claim 1 in which
Z represents Z^2 ,
Z² represents cycloalkyl or bicycloalkyl having in each case 3 to 10 carbon
atoms, each of which radicals is optionally mono- to tetrasubstituted by
5 identical or different substituents from the group consisting of halogen
and/or C₁-C₄-alkyl.

5

7. The oxathiincarboxamide of the formula (I) as claimed in claim 1 in which
Z represents Z^3 ,
10 Z³ represents unsubstituted C₂-C₂₀-alkyl or represents C₁-C₂₀-alkyl which is
monosubstituted or polysubstituted by identical or different substituents
from the group consisting of fluorine, chlorine, bromine, iodine and C₃-C₆-
cycloalkyl, where the cycloalkyl moiety for its part may optionally be mono-
to tetrasubstituted by identical or different substituents from the group
15 consisting of fluorine, chlorine, bromine, iodine, C₁-C₄-alkyl and/or C₁-C₄-
haloalkyl.

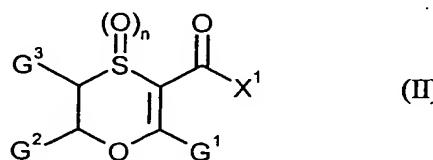
15

8. The oxathiincarboxamide of the formula (I) as claimed in claim 1 in which
Z represents Z^4 ,
20 Z⁴ represents C₂-C₂₀-alkenyl or C₂-C₂₀-alkynyl, each of which is mono- or
polysubstituted by identical or different substituents from the group
consisting of fluorine, chlorine, bromine, iodine and C₃-C₆-cycloalkyl,
where the cycloalkyl moiety for its part may optionally be mono- to tetra-
substituted by identical or different substituents from the group consisting of
25 fluorine, chlorine, bromine, iodine, C₁-C₄-alkyl and C₁-C₄-haloalkyl.

25

9. A process for preparing the oxathiincarboxamides of the formula (I) as claimed in
claim 1, characterized in that
a) oxathiincarboxylic acid derivatives of the formula (II)

30

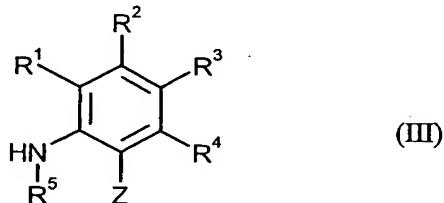


in which

G¹, G², G³ and n are as defined in claim 1,

X¹ represents halogen or hydroxyl,

are reacted with aniline derivatives of the formula (III)



5

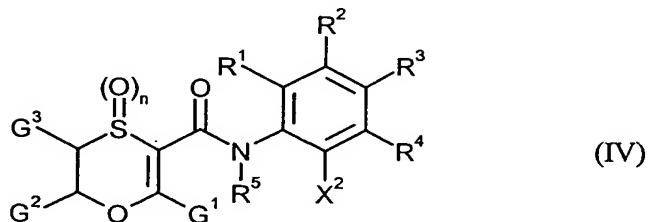
in which

R¹, R², R³, R⁴, R⁵ and Z are as defined in claim 1,

10

if appropriate in the presence of a catalyst, if appropriate in the presence of a condensing agent, if appropriate in the presence of an acid binder and if appropriate in the presence of a diluent, or

b) halooxathiincarboxamides of the formula (IV)



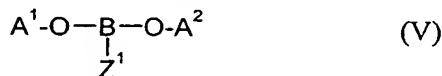
in which

15

G¹, G², G³, n, R¹, R², R³, R⁴ and R⁵ are as defined in claim 1,

X² represents bromine or iodine,

are reacted with boronic acid derivatives of the formula (V)



20

in which

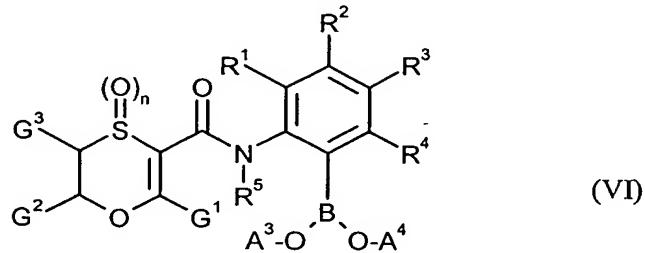
Z¹ is as defined in claim 1 and

A¹ and A² each represent hydrogen or together represent tetramethyl-ethylene,

25

in the presence of a catalyst, if appropriate in the presence of an acid binder and if appropriate in the presence of a diluent, or

c) oxathiincarboxamide boronic acid derivatives of the formula (VI)

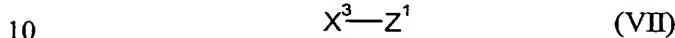


in which

5 $G^1, G^2, G^3, n, R^1, R^2, R^3, R^4$ and R^5 are as defined in claim 1,

A^3 and A^4 each represent hydrogen or together represent tetramethyl-
ethylene,

are reacted with phenyl derivatives of the formula (VII)



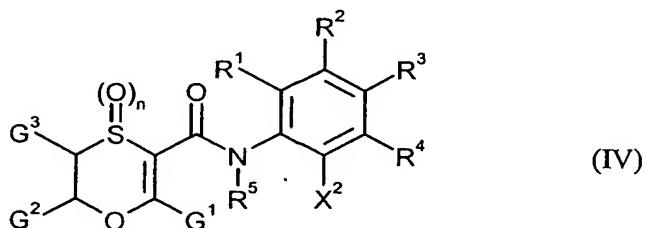
in which

Z^1 is as defined in claim 1 and

X^3 represents chlorine, bromine, iodine or trifluoromethylsulfonate,

15 in the presence of a catalyst, if appropriate in the presence of an acid binder
and if appropriate in the presence of a diluent, or

d) halooxathiincarboxamides of the formula (IV)



20 in which

$G^1, G^2, G^3, n, R^1, R^2, R^3, R^4$ and R^5 are as defined in claim 1,

X^2 represents bromine or iodine,

are reacted with phenyl derivatives of the formula (VII)



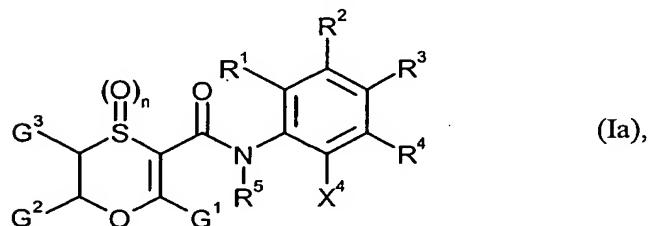
25 in which

Z^1 is as defined in claim 1 and

X^3 represents chlorine, bromine, iodine or trifluoromethylsulfonate,

5 in the presence of a palladium or nickel catalyst and in the presence of 4,4,4',4',5,5,5',5'-octamethyl-2,2'-bis-1,3,2-dioxaborolane, if appropriate in the presence of an acid binder and if appropriate in the presence of a diluent, or

e) oxathiincarboxamides of the formula (Ia)



10

in which

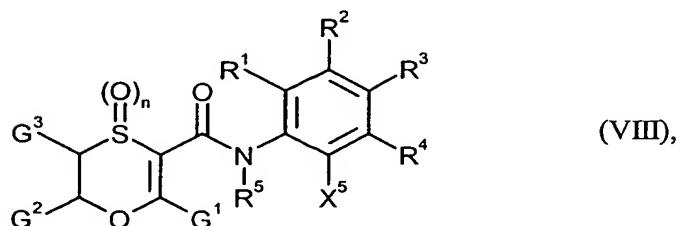
G^1 , G^2 , G^3 , n , R^1 , R^2 , R^3 , R^4 and R^5 are as defined in claim 1,

15

X^4 represents C_2 - C_{20} -alkenyl or C_2 - C_{20} -alkynyl, each of which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C_3 - C_6 -cycloalkyl, where the cycloalkyl moiety for its part may optionally be substituted by halogen and/or C_1 - C_4 -alkyl,

20 are hydrogenated, if appropriate in the presence of a diluent and if appropriate in the presence of a catalyst, or

f) hydroxyalkyloxathiincarboxamides of the formula (VIII)



in which

25

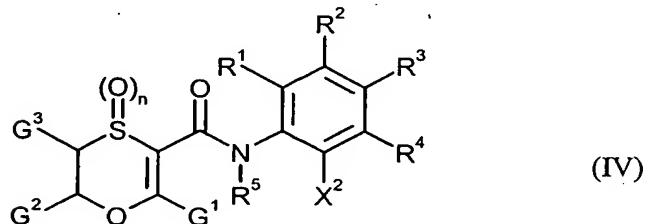
G^1 , G^2 , G^3 , n , R^1 , R^2 , R^3 , R^4 and R^5 are as defined in Claim 1,

X^5 represents C_2 - C_{20} -hydroxyalkyl which is optionally additionally mono- or polysubstituted by identical or different substituents from

the group consisting of halogen and C₃-C₆-cycloalkyl, where the cycloalkyl moiety for its part may optionally be substituted by halogen and/or C₁-C₄-alkyl,

5 are dehydrated, if appropriate in the presence of a diluent and if appropriate in the presence of an acid, or

g) halooxathiincarboxamides of the formula (IV)



10 in which

G¹, G², G³, n, R¹, R², R³, R⁴ and R⁵ are as defined in claim 1,
X² represents bromine or iodine,

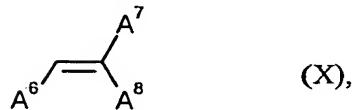
are reacted with an alkyne of the formula (IX)

15 HC≡A⁵ (IX),

in which

A⁵ represents C₂-C₁₈-alkyl, each of which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C₃-C₆-cycloalkyl, where the cycloalkyl moiety for its part may optionally be substituted by halogen and/or C₁-C₄-alkyl,

20 or an alkene of the formula (X)



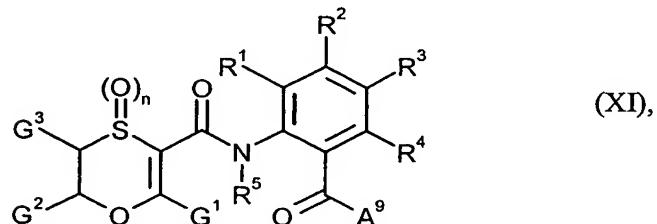
25 in which

A⁶, A⁷ and A⁸ independently of one another each represent hydrogen or alkyl which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C₃-C₆-cycloalkyl, where the cycloalkyl moiety for its part may

optionally be substituted by halogen and/or C₁-C₄-alkyl and the total number of carbon atoms of the open-chain part of the molecule does not exceed the number 20,

5 if appropriate in the presence of a diluent, if appropriate in the presence of an acid binder and in the presence of one or more catalysts, or

h) ketones of the formula (XI)



10 in which

$G^1, G^2, G^3, n, R^1, R^2, R^3, R^4$ and R^5 are as defined in claim 1.

15 A^9 represents hydrogen or C_1 - C_{18} -alkyl which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C_3 - C_6 -cycloalkyl, where the cycloalkyl moiety for its part may optionally be substituted by halogen and/or C_1 - C_4 -alkyl,

are reacted with a phosphorus compound of the formula (XII)

$A^{10} - Px$ (XII),

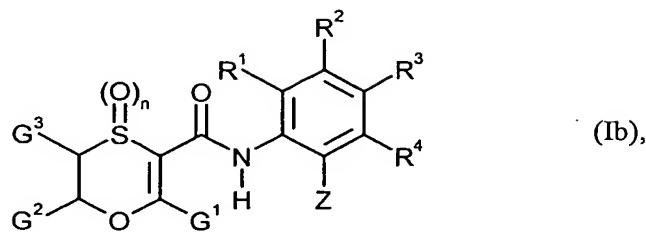
20 in which

A¹⁰ represents C₁-C₁₈-alkyl which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C₃-C₆-cycloalkyl, where the cycloalkyl moiety for its part may optionally be substituted by halogen and/or C₁-C₄-alkyl,

25 Px represents a grouping $-P^+(C_6H_5)_3$ Cl⁻, $-P^+(C_6H_5)_3$ Br⁻, $-P^+(C_6H_5)_3$ I⁻,
 $-P(=O)(OCH_3)_3$ or $-P(=O)(OC_2H_5)_3$,

if appropriate in the presence of a diluent, or

30 i) oxathiincarboxamides of the formula (Ib)



in which

$G^1, G^2, G^3, n, R^1, R^2, R^3, R^4$ and Z are as defined in claim 1,

5

are reacted with halides of the formula (XIII)



in which

10

R^{5-1} represents C_1-C_8 -alkyl, C_1-C_6 -alkylsulfinyl, C_1-C_6 -alkylsulfonyl, C_1-C_4 -alkoxy- C_1-C_4 -alkyl, C_3-C_8 -cycloalkyl; C_1-C_6 -haloalkyl, C_1-C_4 -haloalkylthio, C_1-C_4 -haloalkylsulfinyl, C_1-C_4 -haloalkylsulfonyl, halo- C_1-C_4 -alkoxy- C_1-C_4 -alkyl, C_3-C_8 -halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms, formyl- C_1-C_3 -alkyl, (C_1-C_3 -alkyl)carbonyl- C_1-C_3 -alkyl, (C_1-C_3 -alkoxy)carbonyl- C_1-C_3 -alkyl; (C_1-C_3 -haloalkyl)carbonyl- C_1-C_3 -alkyl, (C_1-C_3 -haloalkoxy)carbonyl- C_1-C_3 -alkyl having in each case 1 to 7 fluorine, chlorine and/or bromine atoms, (C_1-C_3 -alkyl)carbonyl- C_1-C_3 -haloalkyl, (C_1-C_3 -alkoxy)carbonyl- C_1-C_3 -haloalkyl having in each case 1 to 6 fluorine, chlorine and/or bromine atoms, (C_1-C_3 -haloalkyl)-carbonyl- C_1-C_3 -haloalkyl, (C_1-C_3 -haloalkoxy)carbonyl- C_1-C_3 -haloalkyl having in each case 1 to 13 fluorine, chlorine and/or bromine atoms; $-COR^6$, $-CONR^7R^8$ or $-CH_2NR^9R^{10}$,

15

R^6, R^7, R^8, R^9 and R^{10} are as defined in claim 1,

20

X^6 represents chlorine, bromine or iodine,

25

in the presence of a base and in the presence of a diluent.

30

10. A composition for controlling unwanted microorganisms, characterized in that they comprise at least one oxathiincarboxamide of the formula (I) as claimed in claim 1, in addition to extenders and/or surfactants.
11. The use of oxathiincarboxamides of the formula (I) as claimed in claim 1 for

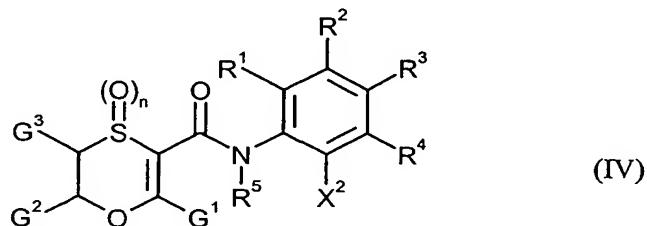
controlling unwanted microorganisms.

12. A method for controlling unwanted microorganisms, characterized in that oxathiincarboxamides of the formula (I) as claimed in claim 1 are applied to the
5 microorganisms and/or their habitat.

13. A process for preparing compositions for controlling unwanted microorganisms, characterized in that oxathiincarboxamides of the formula (I) as claimed in claim 1 are mixed with extenders and/or surfactants.

10

14. A halooxathiincarboxamide of the formula (IV)

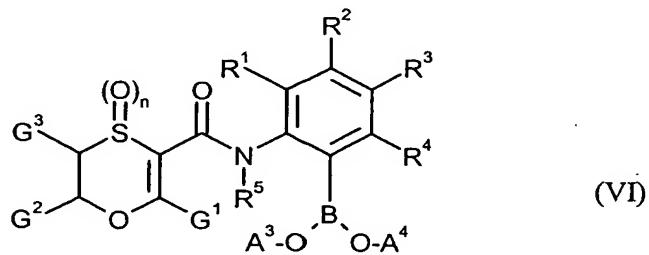


in which

G¹, G², G³, n, R¹, R², R³, R⁴ and R⁵ are as defined in claim 1, and

15 X² represents bromine or iodine.

15. An oxathiincarboxamideboronic acid derivative of the formula (VI)

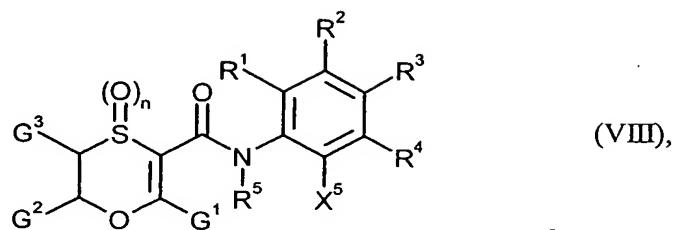


in which

20 G¹, G², G³, n, R¹, R², R³, R⁴ and R⁵ are as defined in claim 1 and

A³ and A⁴ each represent hydrogen or together represent tetramethylethylene.

16. A hydroxyalkyloxathiincarboxamide of the formula (VIII)

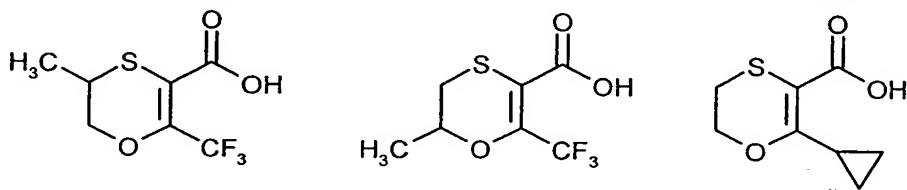


in which

G^1 , G^2 , G^3 , n , R^1 , R^2 , R^3 , R^4 and R^5 are as defined in claim 1 and

X^5 represents C_2 - C_{20} -hydroxyalkyl which is optionally additionally mono- or
5 polysubstituted by identical or different substituents from the group
consisting of halogen and C_3 - C_6 -cycloalkyl, where the cycloalkyl moiety for
its part may optionally be substituted by halogen and/or C_1 - C_4 -alkyl.

17. An oxathiincarboxylic acid derivative of the formula (II) selected from



10

18. An aniline derivative of the formula (III) selected from

